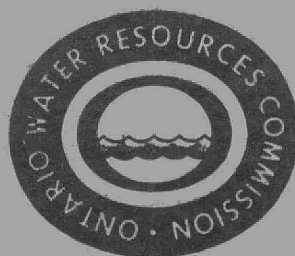


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*O.W.R.C.  
Water Quality  
Survey*

THE  
ONTARIO WATER RESOURCES  
COMMISSION

WATER QUALITY SURVEY

of

PRESTON LAKE

TOWNSHIP OF WHITCHURCH

1970



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REPORT  
ON A  
WATER QUALITY SURVEY

OF  
PRESTON LAKE  
TOWNSHIP OF WHITCHURCH  
COUNTY OF YORK

July, 1970

DISTRICT ENGINEERS BRANCH  
DIVISION OF SANITARY ENGINEERING

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# R E P O R T

## THE ONTARIO WATER RESOURCES COMMISSION

### I INTRODUCTION

A water quality survey of Preston Lake was made in July, 1970. Investigations of this type are made routinely and upon request.

Potential and existing sources of pollution are noted and recommendations are made with respect to pollution abatement and prevention.

### II GENERAL

Preston Lake is located in Whitchurch Township 3.5 miles north of Gormley and 1000 feet east of Don Mills Road. This land-locked lake is small in area (approximately 67 acres) and is fed by springs. There are approximately 7 cottages located around the lake and there are about 14 families who maintain permanent residences.

### III WATER USES

#### 1. Recreational

The area is used for resort purposes, boating, swimming, water sports and some fishing.

#### 2. Water Supply

Drinking water supply reportedly is obtained from the lake and wells on an individual basis. Some homes on the southern portion of the lake chlorinate their drinking water and we recommend that all surface supplies should be chlorinated.

### 3. Sanitary Waste Disposal

Septic tank and tile bed systems are reportedly the most common method of sewage disposal employed.

There have been no complaints of these systems malfunctioning in the past year according to the York County Health Unit. Pepper Pot Lodge which is a picnic park with swimming, camping and trailer facilities has a septic tank system for the lodge and utilizes portable privies for the camping and trailer facilities. The lodge is located at the north-west portion of the lake.

### 4. Surface Water Quality

Table No. 1 presents the results of the samples collected in connection with this report. Figure No. 1 shows approximate location of the sampling points.

## IV RESULTS OF LABORATORY ANALYSES

The results of the bacteriological examination of the water samples were not unusual for a small lake, where recreational activity such as swimming had recently occurred. All the results were within the recommended total and fecal coliform criteria for swimming. The BOD and suspended solids levels indicate that the water is of satisfactory quality.

Phenol concentrations at sampling stations PL-4, PL-6 and PL-8 were measured and their concentrations could cause

taste and odour problems with chlorinated water supplies from the lake. Chloro-phenolic taste and odour problems can occur in a chlorinated water supply at phenol concentrations as low as 5 ppb.

Phenol concentrations can occur due to the decay of certain algae; however, the algae concentrations were not considered to be of sufficient density to be causing the levels of phenols at stations PL-4, PL-6 and PL-8. The only other likely cause would be from power boating activity.

#### V DISCUSSION

The phenol concentrations measured at some of the sampling stations are likely the result of power boat activity.

There are ways that power boating may be controlled. If an individual has water rights to a complete lake then of course he can decree that no power boating should be allowed. To control it under the OWRC Act would be extremely difficult and would likely entail prosecuting individual boat owners, a lengthy time consuming and probably not entirely satisfactory process.

The latter course may be likened to prosecuting under the Air Pollution Control Act owners of automobiles using the internal combustion engine. Fortunately the pollutants

from the internal combustion engine can be minimized by a vehicle emission control device now mandatory on the late model automobiles.

Modifications of the outboard motor to reduce and/or eliminate pollutants (oil, etc.) have not yet reached any significant state. It is estimated that it would be at least four or five years before any new engines could come on the market.

The local municipality may see fit to pass a by-law prohibiting or restricting power boat activity on such a small lake on the basis of noise, inconvenience and dangers presented to other pursuits on the lake such as fishing, swimming, canoeing and boating, etc.

Boats using electric motors would eliminate any phenol and noise problems. There would still be some conflict between users of slower moving crafts and the speedier boats using electric motors.

## VI SUMMARY AND CONCLUSIONS

### Summary

A sampling program to determine the water quality in Preston Lake was accomplished in July, 1970. There was evidence that power boating activity likely causes a phenol concentration in the parts of the lake which could cause problems with taste and odours being created



in surface water supplies (which should be chlorinated or boiled before drinking).

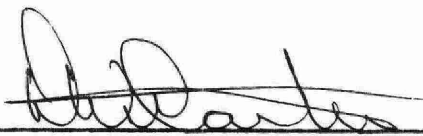
On this relatively small lake it would be wise to restrict boating to manual powered crafts (canoes, row boats, etc.). This would reduce phenol concentrations in the water and also reduce hazards to other users of the water.

It appears that the most expedient way to prohibit power boating on the lake would be for the municipality to pass a by-law to this effect.

#### VII RECOMMENDATIONS

1. If it is the wish of those concerned, that power boating be prohibited on the Lake, the recommended method is considered to be via the enacting of a by-law in this regard, by the municipality.

Prepared by:

  
D.W. Carter, Civil Technologist  
District Engineers Branch  
Division of Sanitary Engineer

/cs

## APPENDICES

### GLOSSARY OF TERMS

Bacteriological Examinations - The Membrane Filter technique is used to obtain a direct enumeration of coliform organisms. These organisms are the normal inhabitants of the intestines of man and other warm-blooded animals. They are always present in large number in sewage and are, in general, relatively few in number in other stream pollutants. The results are reported as MF coliform count per 100 millilitres.

Biochemical Oxygen Demand (BOD) - The BOD test indicates the amount of oxygen required for stabilization of the decomposable organic matter found in the sewage, sewage effluent, polluted waters or industrial wastes by aerobic biochemical action. The time and temperature used are 5 days and 20° C respectively.

Solids - The analyses for solids include tests for total, suspended and dissolved solids. The former measures both the solids in solution and in suspension. Suspended solids indicate the measure of undissolved solids of organic or inorganic nature, whereas the dissolved solids are a measure of those solids in solution.

### Phosphorus

Total Phosphorus - Total Phosphorus is a measure of both the organic and inorganic forms of phosphorus present.

Soluble Phosphorus - Soluble Phosphorus is a measure of the orthophosphate only and when subtracted from the total

phosphorus gives an indication of the concentration of organic phosphorus present. That is, the soluble phosphorus is a measure of the inorganic phosphorus present except the phosphorus in the form of polyphosphate, which however, in surface waters is usually insignificant. Inorganic phosphorus in concentration in excess of 0.01 ppm may cause nuisance conditions.

### Nitrogen

Ammonia Nitrogen or sometimes called free ammonia is the insoluble product in the decomposition of nitrogenous organic matter. It is also formed when nitrates and nitrites are reduced to ammonia either biologically or chemically. Some small amounts of ammonia, too, may be swept out of the atmosphere by rain water.

The following values may be of general significance in appraising free ammonia content: Low 0.015 to 0.03 ppm; moderate 0.03 to 0.10 ppm; high 0.10 or greater.

Total Kjeldahl is a measure of the total nitrogenous matter present except that measured as nitrite and nitrate nitrogens. The Total Kjeldahl less the Ammonia Nitrogen measures the organic nitrogen present. Ammonia and organic nitrogen determinations are important in determining the availability of nitrogen for biological utilization. The normal range for Total Kjeldahl would be 0.1 to 0.5 ppm.

### Nitrite Nitrogen

Nitrite is usually an intermediate oxidation of ammonia. The significance of nitrites, therefore, varies with their amount, sources, and relation to other constituents of the sample, notably the relative magnitude of ammonia and nitrite present. Since nitrite is rapidly and easily converted to nitrate, its presence in concentrations greater than a few thousandths of a part per million is generally indicative of active biological processes in the water.

### Nitrate Nitrogen

Nitrate is the end product of aerobic decomposition of nitrogenous matter, and its presence carries this significance. Nitrate concentration is of particular interest in relation to the other forms of nitrogen that may be present in the sample. Nitrates occur in the crust of the earth in many places and are a source of its fertility.

The following ranges in concentration may be used as a guide: low less than 0.1 ppm; moderate 0.1 to 1.0 ppm; high greater than 1.0 ppm.

### Phenols

The presence of phenol or phenolic equivalents is generally associated with discharges containing petroleum products, or with wastes from some industries. It is generally conceded that adequate protection of surface waters will be

provided if the concentration of phenols in waste discharges does not exceed 20 parts per billion (ppb). Phenolic type waste can cause objectionable conditions in water supplies and might taint the flesh of fish.

TOWNSHIP OF WHITCHURCH  
PRESTON LAKE  
TABLE I

SAMPLING POINT NUMBER	DESCRIPTION	DATE	5-DAY BOD (PPM)	SOLIDS (PPM)			P		N				PHENOLS (PPB)	MF COLIFORMS PER 100 ML	
				TOTAL	SUSP.	DISS.	TOT.	SOL.	FREE AMMONIA	TOTAL KJELDAHL	NITRITE	NITRATE		TOTAL	FECAL
PL-1	S.E. CORNER BETWEEN 2 SIGNS "STA. C"	JULY 27	3.5	170	10	160	.10	.008	.03	1.5	.004	<.01	0	28	4
PL-2	CENTRE OF LAKE BETWEEN 2 SIGNS "STA. B"	JULY 27	2.0	120	5	115	.024	.012	.02	.74	.002	<.01	0	24	4
	5 FT. DEPTH	JULY 27												4	72
PL-3	WEST SIDE OF LAKE "STA. A"	JULY 27	3.0	140	10	130	.071	.006	.04	1.0	.002	<.01	3	24	84
PL-4	S.W. CORNER DRAINAGE	JULY 27	2.0	120	5	115	.059	.004	.02	1.0	.002	<.01	14	280	44
PL-5	BOAT HOUSE - S.W. CORNER	JULY 27	2.0	120	5	115	.027	.002	.03	.74	.002	<.01	0		
PL-6	W. OF BATHING AREA - S. OF LAKE	JULY 27	1.5	100	5	95	.024	.002	.01	.52	.002	<.01	35	68	4
PL-7	BETWEEN DOCKS OPPOSITE WHITE HOUSE S. SIDE	JULY 27	1.5	100	5	95	.014	.002	.02	.53	.002	<.01	6	90	8
PL-8	WEST OF NIMMO RESIDENCE	JULY 27	1.5	110	5	105	.023	.002	.01	.56	.002	<.01	17	170	56
PL-9	NIMMO'S RESIDENCE	JULY 27	2.0	100	5	95	.032	.002	.02	.62	.002	<.01	6	100	4
PL-10	N.E. SHORE BY DOCK	JULY 27	2.0	100	5	95	.031	.003	.03	.58	.002	<.01	5	20	4
PL-11	N.N.E. OF SHORE	JULY 27	2.0	110	5	105	.031	.002	.04	.63	.002	<.01	0	168	24
PL-12	ENTRANCE TO N.E. CORNER OF LAKE	JULY 27	1.0	120	5	115	.079	.002	<.01	.63	.002	<.01	0	64	4





LEGEND  
[Symbol: PL-2 STA. B] - SAMPLING POINT (APPROX. LOCATION)



*[Water quality survey]*

ONTARIO WATER RESOURCES COMMISSION	
PRESTON LAKE	
WATER POLLUTION SURVEY	
1970	
SCALE: 1" = 250' (APPROX.)	
DRAWN BY: R.D.L.	DATE: OCTOBER 1970
CHECKED BY:	DRAWING NO. 70-161 DE

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REPORTS SENT TO:-

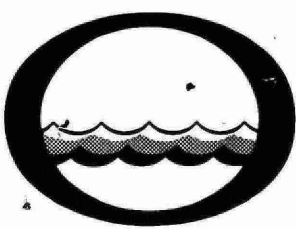
The Corporation of the Township of Whitchurch, R.R. #1,  
Gormley, Ontario. Attention: Mr.T. Kerr, Clerk-Treasurer.

Dr.J.O. Slingerland, M.O.H., York County District Health  
Unit, 22 Prospect Street, Newmarket, Ontario.

Hon. George A. Kerr, Minister, Department of Energy and  
Resources Management, Parliament Buildings, Toronto, Ontario.

Queen's Park Library, Parliament Buildings, Toronto, Ontario.





**Water management in Ontario**

Ontario  
Water Resources  
Commission

135 St. Clair Ave. W.  
Toronto 7, Ontario  
Tel. 365-6967

November 26, 1970.

The Corporation of the  
Township of Whitchurch,  
R.R. #1,  
GORMLEY, Ontario.

Attention: Mr. T. Kerr, Clerk-Treasurer.

Dear Sir:

Re: Township of Whitchurch,  
Water Quality Survey.

We are attaching a copy of a report on a water quality survey of Preston Lake.

The water quality of Preston Lake is good. However, power boating does cause a phenol concentration which, at times, could produce a taste and odour problem, should any person be using the lake as a source of water supply. If the user is following the recommendation that all surface supplies be chlorinated prior to ingestion taste and odour problems would increase.

Since Preston Lake is a small lake the hazards created by power boating to other users such as swimmers, canoeists etc., has to be considered. There is also the problem of noise associated with power boating.

We have made our recommendation as follows:

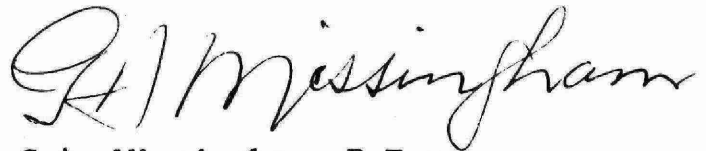
1. If it is the wish of those concerned, that power boating be prohibited on the lake, the recommended method is considered to be via the enacting of a by-law in this regard, by the municipality.

...continued

...2

Please inform us what action will be taken.

Yours truly,

A handwritten signature in cursive script, reading "G.A. Missingham". The signature is written in dark ink and is positioned above the typed name and title.

G.A. Missingham, P.Eng.,  
District Engineer,  
Division of Sanitary Engineering.

DWC/elc  
encl:



\*96936000009191\*